

Claims

- 5 1. A process for patinating articles comprising copper or a copper alloy by means of an in particular aqueous patination solution containing copper ions, characterized in that the article is treated with the patination solution, preferably by applying the patination solution to the article, and the article which has been treated in this way is subjected to a maturing process.
- 10 2. The process as claimed in claim 1, characterized in that during the maturing process, temperature and atmospheric humidity are selected, preferably controlled in a temperature- and humidity-controlled chamber.
- 15 3. The process as claimed in claim 1 or 2, characterized in that the maturing process encompasses the following maturing steps:
- allowing the treated article to rest at a first rest temperature and a first rest atmospheric humidity for a first rest time,
  - 20 - irrigating the treated article at least once at an irrigation temperature and an irrigation atmospheric humidity for an irrigation time, and
  - allowing the treated article to rest at a second rest temperature and a second rest atmospheric humidity for a
- 25 second rest time.
- 30 4. The process as claimed in claim 3, characterized in that the rest temperatures are in the range from 20°C to 70°C, in particular from 25°C to 55°C, and the rest atmospheric humidities are in the range from 30% to 90%, in particular from 40% to 50%.

5. The process as claimed in claim 3 or 4, characterized in that the second rest temperature corresponds essentially to the first rest temperature and the second rest atmospheric humidity corresponds essentially to the first rest atmospheric humidity.

5

6. The process as claimed in any of claims 3 to 5, characterized in that the irrigation temperature is in the range from 20°C to 70°C, in particular from 25°C to 55°C, and the irrigation atmospheric humidity is in the range from 30% to 95%, in particular from 65% to 80%.

10

7. The process as claimed in any of claims 3 to 6, characterized in that the first rest time and the second rest time are each up to one week, preferably from 2 to 3 days.

15

8. The process as claimed in any of claims 3 to 7, characterized in that the irrigation time is up to one day, preferably from 5 to 10 hours.

- 20 9. The process as claimed in any of the preceding claims, characterized in that the patination solution contains at least one copper salt, preferably copper nitrate, in a proportion of from 1.5% to 20% by weight, in particular in a proportion of from 3% by weight to 5% by weight.

25

10. The process as claimed in any of the preceding claims, characterized in that the patination solution contains at least one zinc salt, preferably zinc chloride.

- 30 11. The process as claimed in claim 10, characterized in that the patination solution contains the zinc salt in a proportion of from

0.1% by weight to 5% by weight, in particular in a proportion of from 0.2% by weight to 1% by weight.

5 12. The process as claimed in any of the preceding claims, characterized in that chloride and carbonate additives, in particular sodium chloride, ammonium chloride, calcium chloride and/or ammonium carbonate, are present in the patination solution.

10 13. The process as claimed in any of the preceding claims, characterized in that at least one surface treatment selected from the group consisting of cleaning and roughening of the surface is carried out prior to the treatment of the article.

15 14. The process as claimed in claim 13, characterized in that the cleaning procedure is degreasing, in particular chemical degreasing.

20 15. The process as claimed in claim 13 or 14, characterized in that the roughening procedure is grinding or a blasting treatment, in particular a glass sandblasting.

25 16. The process as claimed in any of the preceding claims, characterized in that the patination solution is applied in finely divided form, in particular is sprayed on.

17. The process as claimed in any of the preceding claims, characterized in that a treatment temperature in the range from 30°C to 70°C, in particular in the range from 40°C to 55°C, is selected in the treatment of the article with the patination solution.

18. The process as claimed in any of the preceding claims, characterized in that the patination solution is applied in at least two, preferably 4 – 5, treatment steps.
- 5 19. The process as claimed in any of the preceding claims, characterized in that at least one surface after-treatment selected from the group consisting of sealing, lightening and darkening of the surface is carried out after the maturing process.
- 10 20. The process as claimed in any of the preceding claims, characterized in that the article to be patinated is selected from the group consisting of plate material, strip material, shaped part and ornament.
- 15 21. A patination solution for patinating articles comprising copper or a copper alloy in the form of a preferably aqueous copper salt solution, characterized in that the solution contains zinc ions.
- 20 22. The patination solution as claimed in claim 21, characterized in that it contains a zinc salt, in particular zinc chloride, preferably in a proportion of from 0.1% by weight to 5% by weight, in particular from 0.2% by weight to 1% by weight.
- 25 23. The patination solution as claimed in claim 21 or 22, characterized in that at least one copper salt, preferably copper nitrate, is present in a proportion of from 1.5% by weight to 20% by weight, in particular from 3% by weight to 5% by weight.
- 30 24. The patination solution as claimed in any of claims 21 to 23, characterized in that chloride and carbonate additives, in particular sodium chloride, ammonium chloride, calcium chloride and/or ammonium carbonate, are present in the solution.

25. A patinated article comprising copper or a copper alloy, which can be produced by a process as claimed in any of claims 1 to 20.
- 5 26. A patinated article comprising copper or a copper alloy, which has been produced by a process as claimed in any of claims 1 to 20.
27. The patinated article comprising copper or a copper alloy as claimed in claim 25 or 26, characterized in that it has the following structure:
- 10
- a base body comprising copper or a copper alloy selected from the group consisting of plate material, strip material, shaped part and ornament and
  - at least one patina layer which is located on the base body
- 15 and contains copper ions and zinc ions.
28. The patinated article as claimed in any of claims 25 to 27, characterized in that the thickness of the patina is from 0.02 to 0.06 mm, in particular from 0.03 to 0.05 mm.

-----